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# The Effects of Microcredit on Households Economy in Cambodia

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## Abstract

The impacts of loan on livelihoods' households such as incomes, consumptions, education and their assets in Cambodia are very important to finger out. The AMK data is employed in the year 2007, 2012, 2013 and 2014 which is determined and surveyed entire 18 provinces of Cambodia by research department. The empirical findings to meet the objectives of this study by using Ordinary Least Squares regression (OLS), Fixed Effect model(FE) and Random Effect model(RE). Fixed Effect model is most appropriate tool to use and it suggests that most households using AMK loans increased their livelihoods and incomes. Casual impacts of loan show that other loan get worse off in terms of education expenditures while AMK loans improve the education of the households. Furthermore, loans impact positively on the health expenditures. This increases around 1.03% of health expenditures. AMK loan improves the households' educations around 12.39% across the years. Clients of AMK can foster the households' incomes by 4% due to the regression result.

In term of assets, AMK loan improves positively to the total land usage. Most of AMK clients have lesser educational levels than non-clients shown in this survey. Households like to use two loan sources respectively while their incomes have extremely limited. To prove more details, Cambodian households usually use the loan in non-productive business such as wedding expenditures, funeral expenditures, dwelling expenditures and other make-up tools which do not earn much incomes for their livelihoods.

**JEL CODE: O16, L31**

**Key Words:** Micro-credits, MFIs and Over-indebtedness, Financial Inclusion, Cambodia.

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## **1. Introduction**

The microfinance and its history seems several developments and innovations in its operations supported by favorable policy reforms. The first microfinance institution had already been established since the 1980s such as the Grameen Bank founded by Muhammad Yunus. This is nowadays, one of the most development tools to employ to fight poverty trap in around the world especially to the developing countries. Most financial products produced by microfinance institutions (MFIs) target to the poor by solving market failures in rural credit market, such as reducing costs and solving the asymmetric information issues. Some microcredit products provide more access to credit for low income people who do not have collateral by offering a group lending. MFIs, therefore, have helped the rural population increased their income and accumulated assets to mitigate the risks, such as illness and natural disasters, while facilitating the development of micro-enterprises. In this sense, Cambodia's microfinance has played a major role in poverty reduction via its financial inclusion and consumptions smoothing (Sophat, 2020a).

In the context of Cambodia, people with limited resources or collaterals are in need for access to credit in order to invest for their daily income earning from agriculture activities or for their small nonfarm business with their skills and knowledge too. If they are ignored, they must hardly allocate their resource with less outcome and make them to be poorer. The higher demand of credit is still challenge to poor living in rural areas of Cambodia while there is also the lack of financial institutions expanded its services to rural areas and door to door. Due to the world bank mentioned that agriculture is a crucial source of country's economy and rural communities are employed in this sector. The agricultural sector employment rate is more than two third of the total labor force. An imbalance of macroeconomic including uncontrolled inflation and, a rigid interest rate regime makes the country's economy grow at a very slow pace. More than 32 % of population are living under the poverty line, and it is one of the least developing country in the world. In addition, the poor can be defined as a person who has been living under the poverty line (\$1.25 and \$2 per day). Furthermore, the formal financial institutions and services in Cambodia mostly seem to be located in urban and economical provinces nearby the capital city than rural area. Most borrowers must have properties or collaterals to access loan from those institutions. Some rural provinces like Stung Treng, Rottanak Kiri and Mondul Kiri provinces are very low financial services and most of MFIs and banks rarely located to those provinces too. This means that vulnerable and poor households in that countryside had depended on MFIs or private lenders or

informal micro-lenders to secure needed credit to enhance their welfare and economic activities (Sophat, 2019b).

This study emphasizes on exploring the recent situations of Cambodian microfinance development and its loan impacts on the households such as incomes, education, assets and health expenditures. Furthermore, there are 7 sections organized as follows. Section 2 mentions about microfinance History. Section 3 describes the AMK microfinance institution: History and its products. Section 4 reviews the literature Reviews. Section 5 describes Research Methodology. Section 6 presents the results and its comparison regression. Section 7 is the final section for the conclusion and Policy Implication.

## **2. Microfinance History**

Over a decade to now, microfinance has hastily progressed and developed from the small field of micro credit to the more vital ideal of microfinances which derive financial products and its services for entire households. About 40% of the long run impact of financial development on the income growth of the poorest quintile is the result of reductions in income inequality, while 60% is due to the impact of financial development on aggregate economic growth. Furthermore, financial development is associated with a drop in the fraction of the population living on less than \$1 a day, a result which holds when conditioning on average growth (World Bank, 2007). Microfinance is a major component to eliminate poverty in developing countries and it gives access to financial and non-financial services low income people, who wish to access money for starting or extending and income generating activities (Yunus, 1999). Due to Amendariz (2010), Microfinance presents a series of exciting possibilities for extending markets, reducing poverty, and fostering social change. Kaboski and Townsend (2012), they tried to find the impacts of credit on village economies in Thailand due to employ structural model with 2sls and Instrument theory of econometrical terms. They founded that the village funds have increased total short term credit, consumption, agricultural investment, and income growth to village economy. Expanding access to credit helps improve livelihoods of resource poor rural households land, especially via formal credit; helps mobilize assets to improve agricultural productivity (ADB, 2008).

The World Bank report said that the rural community income is not only low, but also they are volatile income because households depend on weather-based agricultural income and unpredictable jobs. The crucial challenge for the poorer in the rural area is to meet their daily needs. Therefore, “irregular income” needs to become “regular income” which is fundamental for them.

As such, it is important to have an outsource funding to cover their unexpected costs and also daily expenditure including their food and security, illness of household member and others social costs such as providing financial assistance to relatives and neighbors in times of emergency. In the financial inclusion-report, the World Bank mentioned that the majority of the poor are excluded from the banking population. However, as per their aim, the financial inclusion managed to decrease the numbers of non-banking population from 2.5 billion in 2011 to 2.0 billion in 2014.

Microfinance is a key component to eliminate poverty in developing countries. One of the expectations of microfinance is to facilitate a start-up business and to help the initial process of adopting a new practice in low-income countries (Amendáriz and Morduch (2010)). Professor Mohammad Yunus and Grameen Bank initiated microfinance in Bangladesh focusing on the poor community to alleviate poverty. The loan started with five dollars, finally the project has shown the world how effective it can be and how it can change peoples' lives. Although they implemented the project with microcredit, it was later expanded to encompass the whole of microfinance. The term 'microfinance and microcredit' are similar. However, microcredit is considered one aspect of microfinance. Microfinance is designed to facilitate financial services to the non-banking population. The products from microfinance are savings, credit, protection and insurance and remittance to isolated areas. These services can facilitate the clients to have steady income, and also provide social fund for health and education for poor communities. Sinha (1998) described in his study "microcredit refers to small loans only, while microfinance is appropriate where NGOs and MFIs supplement the loans with other financial services." Schreiner and Colombet (2001) mentioned that microfinance attempts to facilitate small scale loans and deposit for poor households which are neglected by the bank.

presented in their study that MFI is a crucial part of providing loans to low-income communities. It is a way to help these low-income households to attain better savings and protection and insurance. They also mentioned that the famous background history of MFI group lending pattern (solidarity group) is the secret of controlling the default rate without collateral. It also states that MFI has a good record of social impact on the rural communities and it empowered the role of women in community as well. On the other hand, they argued that MFI is not a magic tool for poverty reduction because it is not possible to achieve a good impact for everyone, everywhere.

International developmental organizations adopted their microfinance services in developing countries in order to promote better rural household lives as mentioned in Shah et al

(1980). Now, microfinance plays an important role not only for poverty reduction but also encourages the role of women at household levels and help them to get a better standard of living.

Microfinance institution is a form of financial development that has primarily focused on alleviating poverty through providing financial services such as deposit, loans, payment services, money transfers, small insurance to poor and low income households and their microenterprises (ADB, 2000).

Furthermore, Cambodia's financial institutions such as microfinance institutions, banking and other rural creditors are also mentioned clearly later in 2.1. This part might study more about the literatures and situations of banking and microfinance institutions in Cambodia.

## **2.1 Banking and Microfinance institution in Cambodia**

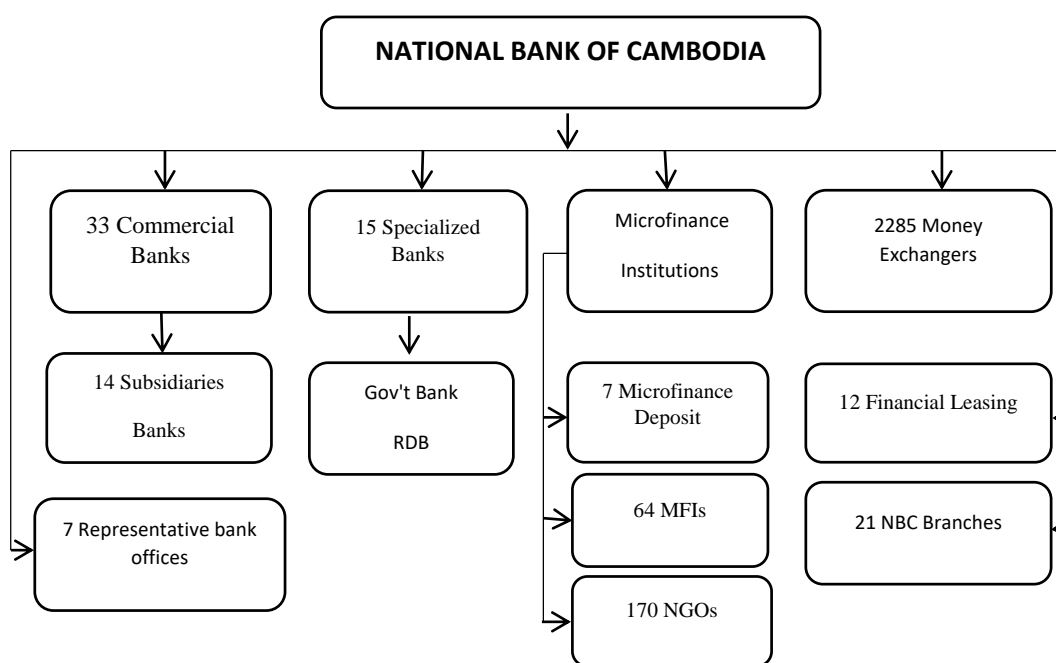
After the decade war, Cambodia has developed so fast and all infrastructures are reformed as well as laws, roads and schools and others sectors as well. In 1991, the first commercial Cambodian bank established a joint venture.

The two-tiered banking system, which allowed the commercial banks and specialized banks run, was made well with the national bank which no longer plays the role as commercial banks, but controls and supervises those commercial and specialized banks.

Since 1993, National Bank of Cambodia has gradually strengthened and modernized the banking system with the fastest growth of the economies in the world. The law on the organization and conduct of the National Bank of Cambodia (NBC) was adopted in 1996. It said independent tasks of the central bank in the conduct of monetary policy and resided clear works on bank credit to the government. The commercial and specialized banks and other financial institutions are now operating under the framework of the law on banking and financial Institutions enacted in 1999 and the current works to improve commercial banking services are based on this law. Moreover, Cambodia loan in the banking system has classified as classes while years comparisons since 2009-2015. There are 33 commercial banks, 15 specialized banks, 71 MFIs and 170 NGOs (rural credit operators). Where 2285 money Exchangers, 12 leasing companies and 21 NBC branches in 2016 due to figure 3.1. In the most real practices in Cambodia, microfinance institutions are playing the main for rural financial services to the poor and helping the poor than some commercial banks. And most of the financial institutions as commercial and specialized banks located in cities and targeting

with near rich people with solid collaterals in order to get the loan. In addition, public specialized bank named Rural Development Bank (RDB) also serves the financial products to rural areas too but its goal stressed mainly on the commercial banks, specialized banks, micro-finance Institutions, associations, development communities and small and medium enterprises (SME) in rural development in Cambodia only, this means that individual poor cannot get any loans directly from these banks. So most of the commercial and specialized banks might not help the poor directly via loan offering to them but only some rural microfinances, registered rural credit agencies and NGOs will go directly by door to door and significantly help them with close branches in rural areas nearby them, furthermore, there are some microfinance without needing the collaterals to offer the loans to poor.

**Table 2.1:** Structure of Banking System in Cambodia



**Source:** National Bank of Cambodia (2016).

Furthermore, the setup of microfinance in the early 1990s focused mainly on improving social needs of the people in terms of providing pieces of trainings and technical knowledge. According to Kim (2010), development of microfinance will make more access of loan facilities to poor with or without collaterals where commercial banks fail to serve. There are three kinds of loans classifications: individual loans, group solidarity loans, and community loans.

Moreover, in the fiscal year 2015, saving deposits have been surged up to 25.5%, about KHR 48.423 trillion. This change was supported by the growth of banks and financial institutions as compared to the

fiscal year 2014. such type of robust growth was accompanied by massive increased in customer's deposit, by 18.9 percent and loan up to 28 percent which makes up to KHR 51.61 trillion and loan up KHR 61.62 trillion respectively. Furthermore, use of ATM cards, credit and debit cards facilities boosted the growth of banks as well as the wellbeing of the rural people. Since 1993 the financial services have been inclusively progressed to the entire country. While the poverty rate of Cambodia dropped remarkably from 43.2 percent in 2004 to 14.7 percent in 2014. The banking sector has played a vital role in contributing to this sector by offering financial services to the poor to raise their income and economic activities in the market (CBC, 2016).

Accordingly, since 2004 to 2016, the increase of microfinance and banks were from 10 to 71 institutions with inclusive networks from 12,833 to 140,121 branches and depots around the provinces, districts, communes, and villages, so it is an extensive flagship of financial services to rural areas too (CBC, 2016). Furthermore, total outstanding loans were 12.5 billion dollars to 2,097,853 clients in 25 provinces and cities of Cambodia.

In 1992, Cambodia Microfinance organizations were initially primed with under governing from Ministry of Interior with title of Non-Governmental Organizations (NGOs) status which their funds from multiple sources and while it did have various projects and infant activities implementations. Due to new initiative operators, many challenges faced failing with these projects because of lacking such strong experiences with these services and clients did not understand its roles and their obligations to pay back.

Many credit operators are operating in rural areas, namely as NGOs or credit operators or agency, microfinance institutions and informal individual lenders and agencies. Currently, there are three kinds of formal rural financial service providers as 7 microfinance institutions taking the deposit, 57 microfinance institutions (Credit Operators) and 168 small rural credit operators or NGOs (NBC, 2016). Mostly This big seven microfinances was transformed from some international NGOs and EU projects which are sources from European Union, GRET, Concern Worldwide, Vision Fund, World Relief (US), OXFAM and Catholic Relief Services (US). Originally, it can be said that most of the biggest MFIs in Cambodia were transformed from the domestic and international NGOs programs.

**Table 2.2:** Name of main NGOs transformed to the biggest MFIs in Cambodia

Year	From NGOs	To MFIs	Amounts of Money	Offices
1993	ACLEDA*	ACLEDA	312,250 USD	6
1995	CCB Organization*	SATHAPANA	525,704 USD	3



1995	EU Program	PRASAC	15.4 billion Riels	6
1991	Gret International	AMRET	330 million Riels	3
1993	Oxfam International	HKL	77,850 USD	1
2002	Catholic Relief Service	LOLC	22 million USD	73
1990	Concern Worldwide	AMK	8 million USD	5
1993	World Vision	VISION FUND	20 million USD	14
1993	World Relief	KREDIT	74.20million USD	70

**Source:** Author and \* Organization

The programs are assets to foster the livelihoods of people in rural areas by providing the small credits to them with some interest rates settlement.

Most of their programs started from the provinces in order to help poor with appropriate interest rate charged. After the growth and sustainability path, NGOs tried to transform from NGOs to microfinance by offering multiple financial services to people. The poverty reduction in rural areas should be focusing increased attention on developing the agricultural sector as the strength of potential linkages between growth in the agricultural sector and poverty reduction depended on the degrees to which the Government, donors, civil society and other key stakeholders can collaborate to better target support for small hold farmers in term of land tenure and access to natural resources, effective water management, removing barriers to efficient marketing, affordable credit, and extension services for crop diversification and livestock production. Furthermore, these microfinances ‘techniques are adopted to transform themselves to microfinances and banks which occurred in some countries around the world, especially in the developing countries such as India, Bangladesh, Nepal as well as Cambodia. In literature reviews, we might learn more details about these microfinances and its impacts on the households around the worlds.

## 2.2 Microfinances and its Rural Financial Views

Historically, Cambodia microfinances have seen positively with all business chains. This sector shows extremely the robust growth due to this following table. When we take a look at the quality of loan which is still solid at average PAR of 0.67% and while the loan written off is 0.132%. The growth of loan outstanding and the numbers of borrowers reveal that borrowers have increased around 13.7%, compare to 2014 to 2015. Whereas, depositors surge at 8.9% in 2015 to 2016.

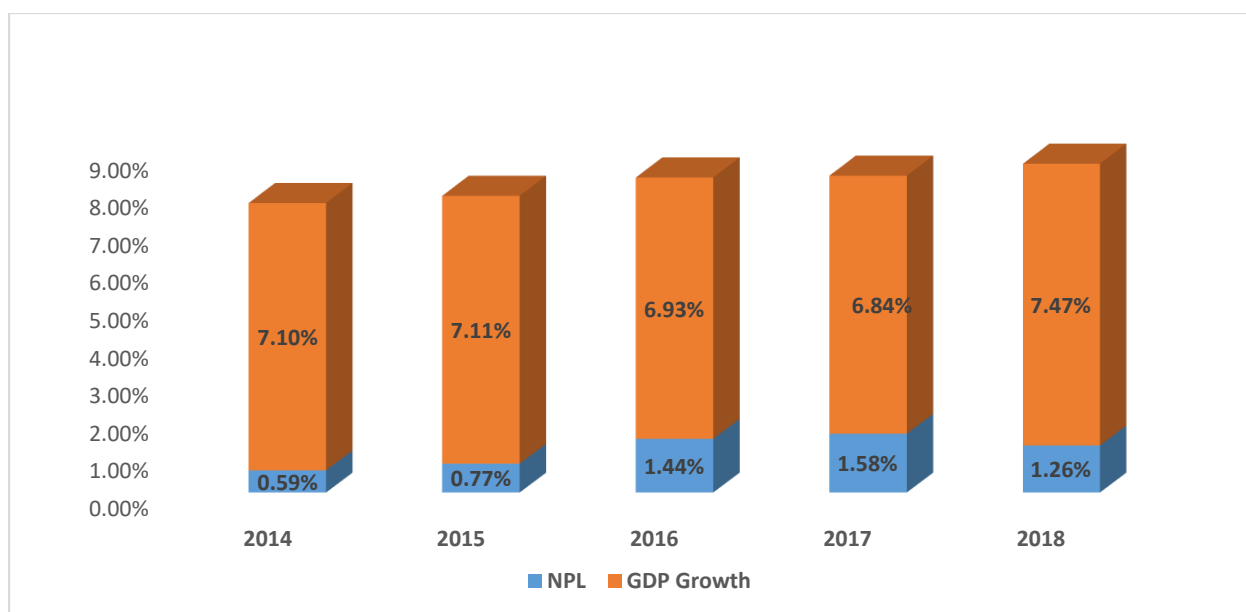
**Table 2.3:** The Performance of Financial Institutions: Microfinances and Banks in Cambodia

Year	Borrowers	Loan Outstanding	Average Loan Size	Depositors	Deposits	Average Deposits
2008	825,238	277.06	335.73	108,266	4.91	45.35
2009	878,559	299.30	340.67	126,099	9.70	76.96
2010	992,452	425.92	429.16	190,023	40.89	215.20
2011	1,151,340	644.64	559.91	280,538	114.61	408.52
2012	1,316,185	892.49	678.09	753,113	279.63	371.30
2013	1,565,566	1,325.20	846.49	899,829	444.98	442.80
2014	1,779,171	2,028.56	1,140.17	1,122,630	896.92	798.94
2015	2,022,235	2,951.72	1,459.63	1,418,732	1,317.82	928.87
2016	1,946,843	2,857.34	1,467.68	1,545,634	2,771.54	1,793

**Source:** Author based on the CMA (2016).

Loan increased around 45.5% in 2015 to over USD 2,951.72 million if compare to 2014. Furthermore, Deposit balance surged by 46.93% to USD 1,317.82 million in 2014. These growths of depositors and loan outstanding show positively to growth of GDP in Cambodia simultaneously. Adversely, non-performance loan(NPL) also consists but it is still manageable. Due to table 2.4, it shows that NPL and GDP growth since 2014 to 2018.

**Table 2.4:** The Relationship of Non-Performance Loan(NPL) and GDP Growth in Cambodia



**Source:** Author's calculation from NBC(NPL) and World Bank(GDP)

It reveals that Cambodia GDP growth trends positively to increase such as NPL ratio too. In 2014, NPL ratio is 0.59% whereas, 1.26% in 2018 respectively. This can say that in term of loan growth, it means that NPL is also increased while GDP growth as well in Cambodia. That might be

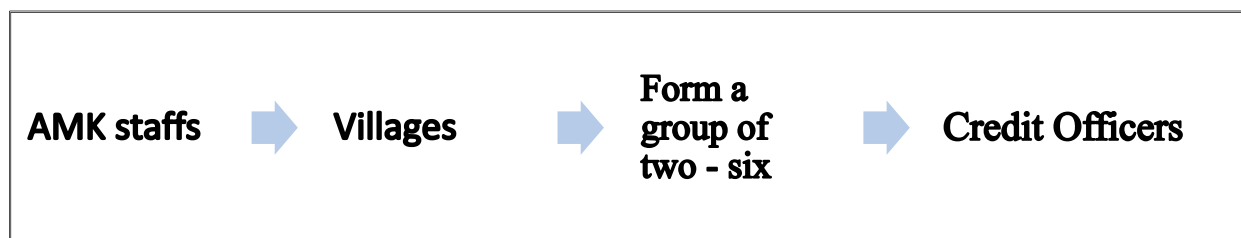
associated with loans and economy growth as well in this context. Next session might mention more details on it. One of the top microfinances in Cambodia, AMK microfinance institution is derived well in order to see more the microfinance landscapes and its views.

### 3. AMK Microfinance Institution: History and Its products

Firstly, AMK microfinance institution, one of the leading MFIs in Cambodia, was transformed from the rural community program of Concern World Wide organization in 2016. To help the poor, AMK has low-interest rates on all group loans, individual loans, and emergency loans, and has more flexible installment for clients in rural areas. Furthermore, all loans of AMK do not require solid collaterals in order to access, and other interesting services such as mobile banking, emergency loan, and micro-insurance help improving access to financial services without needs to extend branches and supporting financial inclusion in Cambodia. AMK's services and products<sup>2</sup> are reliable and diversified to clients who are living in rural areas than other MFIs in Cambodia. AMK programs benefit to clients with loan written off if their clients passed away after ending the loan maturity and with more flexible loan repayments.

Based on the AMK regulations, there are three days for a group to get a loan. Before getting it, AMK staffs visit the villages and announce the details of the loan in the meeting at the village leader's house. After that AMK officers call the poor who are interested in joining the loan group. The second day, villagers form the official groups of interested borrowers with minimum 2 to 6 members in each group. On the third day, group leader is selected by members of treasurers who could manage their saving. After that AMK staff or credit officer (CO) offers the loans. Each group is responsible for each other's installment, or more empowerment from the village bank president to push their members to reimburse their loan.

**Figure 1:** Process of loan process and group loan



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<sup>2</sup>AMK (Cambodia) microfinance has served many services such as (i) loans: group loan, Individual, and emergency loan; (ii) savings: Easy account, Lucky account, Smart kid Account, Fixed deposit, Future account, and Happy old age account; (iii) money transfer; (iv) micro-insurance; (v) payment and payroll services; (vi) foreign exchange and fast services.

**Source:** Author's illustration based on the AMK regulation

Figure 1 shows well about the process of the loan disbursements and its CO performances. Firstly, credit officer(CO) goes to the village and door by door to households in order to promote the AMK products. While villagers are interested to get loans from AMK, the credit officer generates the loan group from two to six people. Credit officers prepares the documents for that group and process the loan.

### **3.1 AMK Products and its Services**

As one of the leading MFIs in Cambodia in 215, AMK Microfinance Institution has 146 branches/ offices operating in 12,394 villages or 88% of entire villages in Cambodia. In addition, AMK has 333,711 loan accounts and 161,728 deposit accounts.

## **4. Literature Reviews**

Microfinance is a key component to eliminate poverty in developing countries. One of the expectations of microfinance is to facilitate a start-up business and to help the initial process of adopting a new practice in low-income countries. (Amendáriz and Morduch (2010)).

Professor Mohammad Yunus and Grameen Bank initiated microfinance in Bangladesh focusing on the poor community to alleviate poverty. The loan started with five dollars, finally the project has shown the world how effective it can be and how it can change peoples' lives. Although they implemented the project with microcredit, it was later expanded to encompass the whole of microfinance. The term 'microfinance and microcredit' are similar. However, microcredit is considered one aspect of microfinance. Microfinance is designed to facilitate financial services to the non-banking population. The products from microfinance are savings, credit, protection and insurance and remittance to isolated areas. These services can facilitate the clients to have steady income, and also provide social fund for health and education for poor communities. Sinha (1998) described in his study "microcredit refers to small loans only, while microfinance is appropriate where NGOs and MFIs supplement the loans with other financial services." Schreiner and Colombet (2001) mentioned that microfinance attempts to facilitate small scale loans and deposit for poor households which are neglected by the bank.

Armendáriz, B., & Morduch, J. (2010) presented in their study that MFI is a crucial part of providing loans to low-income communities. It is a way to help these low-income households to

attain better savings and protection and insurance. They also mentioned that the famous background history of MFI group lending pattern (solidarity group) is the secret of controlling the default rate without collateral. It also states that MFI has a good record of social impact on the rural communities and it empowered the role of women in community as well. On the other hand, they argued that MFI is not a magic tool for poverty reduction because it is not possible to achieve a good impact for everyone, everywhere.

International developmental organizations adopted their microfinance services in developing countries in order to promote better rural household lives as mentioned in Shah et al (1980). Now, microfinance plays an important role not only for poverty reduction but also encourages the role of women at household levels and help them to get a better standard of living.

Microfinance program have been preferred between national governments and international donors in order to improve living standards of the rural population in developing countries. In rural areas, the agricultural sector plays an important role in the country's economy, despite the shortages of capital and resources (Kamajou, 1978; Kinimoz, 1982).

The World Bank report (1975) mentioned that credit was provided to poor farmers in rural areas to access ancillary activities of their skill; the markets, their social services and the beneficiaries also gained additional opportunities from changing technologies. Zeller (1995) mentioned that the concept of microfinance promotes the rural income generation, agricultural loan, maintaining the wealth and stabilization of consumption. In general, there are nine key characteristics of microfinance to alleviate poverty as follows:

1. Small transaction and minimum balance,
2. Loans for entrepreneurial activity,
3. Collateral-free loans,
4. Group lending,
5. Target poorer-clients,
6. Provide mostly to female clients,
7. Simple application process,
8. Provision of services in under-served communities,
9. Market-level interest rate.

In developing countries, policy makers, financial sector and international organizations collaborate together to encourage microfinance to help generate income activities of the communities (Chukuigwe, 2014).

Qureshi (1995) presented in his study that international NGOs provide small-scale loans to impoverished communities without collateral. Microfinance prefers to provide to the active poorer or deserving poorer who have a potential to have a positive impact. The poorest group are likely to have greater risk to face the course of stringent loan repayments to organizations, as mentioned in his empirical study (Kiiru, 2007). Amendariz (2010), Microfinance presents a series of exciting possibilities for extending markets, reducing poverty, and fostering social change. Kaboski and Townsend (2012), they tried to find the impacts of credit on village economies in Thailand due to employ structural model with 2sls and Instrument theory of econometrical terms. They founded that the village funds have increased total short term credit, consumption, agricultural investment, and income growth to village economy. Expanding access to credit helps improve livelihoods of resource poor rural households land, especially via formal credit; helps mobilize assets to improve agricultural productivity (ADB, 2008).

Professor Yunus (1976) started a series of experiments lending to poor households with small amount of money in the nearby village of Jobra in Bangladesh. The loan started with five dollars and even the little money he could lend from his own pocket was enough for villagers to run simple business activities like rice husking and bamboo weaving. And he found that borrowers were not only profiting greatly by access to the loans but that they were also repaying reliably, even though the villagers could offer no collateral. So microfinance institutions are generated to serve financial services to the non-banking population. For some, microfinance is a movement whose object is a world in which as many poor and near poor households as possible have permanent access to an appropriate range of high quality financial services, including not just credit but also savings, insurance, and fund transfers to isolated people. Nwachukwu (2008) quotes that the poor have been observed to be good clients because institutions providing loans to the poor have been having repayment rates exceeding 97 percent. Hollis and Sweetman (2001) discuss the microloan funds in 18th and 19th century Ireland. They mentioned that Irish loan funds thrived for over 100 years due to their ability to change rapidly to external conditions, at one point providing financial services for 20% of Ireland's population. Shinha (1998) said in his research that "microcredit refers to small loan only, while microfinance is appropriate where NGOs and MFIs

supplementary the loans with other financial services. Using the WESML Probit and OLS in order to find the impact of participation by gender in Grameen bank and two to the group based micro credit program in Bangladesh on labor supply, schooling household expenditure and assets which employed with quasi experimental survey village level heterogeneity. It was found that the credit program has larger effect on the behavior of poor households in Bangladesh when women are in the program (Mark & Khandker, 1998). As in the same research, Attanasio et al (2015) tried to find the evidence from a randomized field experiment in rural Mongolia to assess the poverty impacts of a joint liability microcredit program targeted at women. They used some econometrical methods as OLS, IV, and ATT to estimate with 40 villages across 5 provinces in north Mongolia in 2008. The findings showed the positive impacts of access to group loans on female entrepreneurship and household food consumptions but not on total working hours and income in the household. Furthermore, microfinance supports credit for agricultural production, smoothing of rural community's consumption and their income diversification (Kashf, 1996). The formal financial market cannot reach all needy households because the clients do not possess collateral and cannot meet the criteria set by the organizations. In a developed agricultural sector, landlords or the middleman take advantage by doing informal financial services with high interest rates or underpriced collateral manipulating poorer farmers without any bond or evidence (Shah, 2008). They also mentioned in their study that in Sargodha, 50% of the total rural population could not access formal financial services while the majority of the population are engaged in agriculture and remaining population are working on off-farm activities. As Coleman (2002) tries to find the impacts of two microfinances "village bank" targeting in the poor in northeast Thailand. Two microfinances programs are run by Thai NGOs: the rural Friend Association (RFA) location in the northeast province of Surin, and the Foundation for integrated Agricultural management (FIAM), located in Roi-Et province with 445 households in 14 villages in Northeast Thailand. 8 villages were taken from the program for RFA and Other 8 from FIAM in 1995-1996.

As mentioned above, the microfinances show clearly that its impacts are more positive effects on the livelihoods around the world. As well as in developing countries such as Cambodia, Vietnam, Lao, Myanmar and so on. Some challenges could occur with the access of finance in Cambodia, especially in rural areas and the poor group.

#### **4.1 The Impact and Access to Finance in Cambodia: Challenges and Practices**

To access the credit is the main tool for financial inclusion and expansion business growth via credits in Cambodia. Some challenges are lacks of rural economic activities as well as agriculture and non-agriculture in rural areas where outreach, depth of financial products are quite limited and not accessible. The case of Cambodia, empirical study aiming the dynamic impacts of microcredit access on welfare of borrowing households and other purposes have been conducted on 15 provinces with total of 2,977 households. The comparison a treatment group with control groups with credit access and its outcomes had been used to measure this research is by Kang and Liv (2011). The results show that the uses a quasi experimental approach with comparison of two group as client group (test group) and non-clients group (control group). The micro finance has mostly positive effects on their clients with various sectors as change of income, diversifications, assets, women empowerment and social capital etc. There are many contexts observing on this topic, impact of microcredit access with multiple results and debated as research from Khandker and Samad, 2014; Pitt and Khandker, 1998; Pitt et al., 2006; Maksudova,(2010) and Barr, (2005). In Cambodia, the dynamics of microcredit borrowing in Cambodia has recently talked with mixed results from the latest version in 2017 conducted by Roth et al. (2017). Due to this research, They have employed 2011-2014 panel data of eleven villages in Cambodia to observe the impact of microcredit access on paddy quantity and income , expenditure on inputs of paddy production , and self employment income with using Difference in Difference (DiD) method and triple difference estimation. They found that 26.1% increase in paddy income, 68.9% in paddy quantity and 26.5% in expenditure on inputs of paddy production. Mostly poorer households get more benefits from credit participation. Land assets are observed to increase with participations if compare to non client. On the hand, women are more likely to run self employment activities with the loan than men with informal loan source. These findings are the same results of Sophat P. (2021); the impacts of natural disasters and rural finances on the farmers: A case study of Cambodia and inclusive policy which was published in National Bank of Cambodia. The Probit and Logit model with VCE clusters are used with CSES data in Cambodia. Its findings show clearly that farmers need more credits to facilitate their consumptions and improve their livelihoods in entire country.

#### **5. Research Methodology: Econometric Modeling**

In order to response the research question in this part, some econometric models are used to regress with panel data of AMK source in 2015. Some econometric models such as OLS regression,



Fixed Effect Model and Random Effect Model are approached to implement in this research question. In addition, robustness check with Hausman test is calculated to compare the models in order to opt for models with fitness of data. The surveyed data conducted by AMK microfinance institution as our case study of microfinance's effects in Cambodia. In 2015, AMK has operated 25 provincial branches, 151 offices with 12,479 villages or 89% of total villages of Cambodia (AMK, 2016). With a variety of its products that support the poor and coverage across Cambodia, AMK is a good example for this research study.

Firstly, some econometrical models such as Ordinary Least Squared (OLS) model, Fixed Effect Model and Random Effect Model are used in this section as following.

### 5.1 Ordinary Least Squared (OLS) Model

Generally, ordinary least squared model is implemented to describe the AMK data in order to check the correlation between all predictors and outcome variables within an entity.

$$Y_i = \beta_0 + \beta_1 X_i + u_i \quad (1)$$

Whereas,  $Y_i$  is the dependent variable where  $X_i$  is represented the independent variables(IV) as vector of  $X_i$ . Meanwhile,  $\beta_K$  is the coefficient for the IVs.  $u_i$  is error term. Noticed that  $X_i$  is vector of households variables and socio-economic characteristic as well as other control variables. Furthermore, some main dependent variables such as educational levels, income of households and others are very significant to estimate in the regressions. The results are placed in the following section 6. For more clear results, Fixed Effect Model is shown well in the following section.

### 5.2 Fixed Effect Model

In this part, Fixed Effect model is used to regress with the same panel data of AMK in order to check whether, loan impacts on the households' livelihoods and other constraints. Hence, Fixed Effect model is gloriously formed as following:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 AMKLoan_i + \beta_3 Z_i + \beta_3 T_i + u_{it} \quad (2)$$

Whereas,  $Y_i$  is the dependent variable where I is entity and t= time.  $X_i$  is represented the independent variables(IV) as vector of households control such as household's characteristic, expenditures and so on.  $\beta_2$  is the coefficient of AMK loan during the period. Whereas,  $\beta_K$  is the coefficient for the IVs.  $u_i$  is error term. So T is entity n. Since it is binary which included in model. X, Z and T are the matrix of independent variables in equations.

Whereas,  $Y_{it}$   $\left\{ \begin{array}{l} \text{Education} \\ \text{Households' Income} \\ \text{Health Expenditure} \\ \text{Total Expenditures} \\ \text{Total Assets} \\ \text{Total Land Areas} \end{array} \right.$

The results of these regression for Fixed Effect model are determined the following tables.

### 5.3 Random Effect Model

Based on Woodridge (2012), Our Random Effect Model is compiled as following function

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 AMKloan_{it} + \alpha + u_{it} + \varepsilon_{it} \quad (3)$$

Whereas,  $Y_i$  is the dependent variable where I is entity and t= time.  $X_i$  is represented the independent variables(IV) as vector of households control such as household's characteristic, expenditures and so on.  $\beta_2$  is the coefficient of AMK loan during the period. Whereas,  $\beta_K$  is the coefficient for the IVs.  $\varepsilon_{it}$  is error term. So T is entity n. Since it is binary which included in model.  $X$ ,  $\alpha$  and  $u_{it}$  are the matrix of independent variables in equations.

Then, Fixed Effect Model is the consistent and it would be chosen to apply this data. To see more clearly, the regression results are presented at following section. This result of Hausman test in these models is shown at table A2 (Appendix).

## 6. Results and Its Comparison Regressions

This section interprets some parts such as descriptive statistic, loan sources, income and health expenditures, educational levels with clients and non-clients among the years. Furthermore, in order to check the robustness check, the comparison results from all above to opt the optimal one in this paper is used. Descriptive Statistic variables are described in the following section in 6.1.

### 6.1 Descriptive Statistic and Variables

This survey data set conducted by the AMK's research department in the year 2007, 2012, 2013 and 2014, including AMK clients and non-clients in 18 provinces of Cambodia. This cross-sectional data was surveyed across 131 villages. Clients were randomly selected from a list of all AMK clients in each of the village. Non-clients were randomly selected using a systemic random walk

method. In each village, the interview will be conducted for 3 non-client households for every 12 client households. In this context, non-client households are defined as those who do not have any loan with AMK, but they might have loans with other banks, microfinance, and other informal lenders. There will be one client within the household. For all four years of the data set, there are 1,601 households with 1,237 clients and 364 non-clients (table 3). The proportions of non-client households are around 20-25% each year. we analyze in panel data across these years.

**Table 6.1:** Classified client and Non-client households by years

<b>Group</b>	<b>2007</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Clients	281	235	361	360
Non-clients	71	59	114	120
<b>Total</b>	<b>352</b>	<b>294</b>	<b>475</b>	<b>480</b>

**Source:** Author's calculation based on AMK source

Approximately 76.58% of borrowers from AMK are male while 24% is female among totalized 1,237 households across the years. Non-clients, there are 286(79%) for male and 78(21%) for female among 364 households. Hence, totalizing households are 1,601 households in sampling data.

Table 6.2: Summary of AMK clients and Non-clients from sampling data

<b>Genders</b>	<b>AMK Clients</b>		<b>Total</b>
	<i>No</i>	<i>Yes</i>	
Male	286 (79%)	940 (76%)	<b>1,226</b>
Female	78 (21%)	297 (24%)	<b>375</b>
<b>Total</b>	<b>364 (100%)</b>	<b>1,237 (100%)</b>	<b>1,601</b>

**Note:** This is households head gender in data

**Source:** Author's calculation based on AMK data

This result shows that most of household's head in Cambodia are male around 76% and 24% female in the sampling data. This data really applied with reality of Cambodia whereas, the male is income earner in their family. Summary of statistical variables report in table 6.3 suggest more

details of each variable which are used in the regression. Household's age is averaged from 20 to 84 years old, whereas, over 83% of households are married. Household members consist from 1-13 people. In spite of 71% of households can read while 29% households cannot read in the sample survey. Most of households graduated primary school around 48% if compare to other school levels in the survey. If we say about the gender, male about 1,226 are interviewed including the male clients and non-clients in summarization of row while there are 375 female interviewed in this sampling data across the years. Interestingly, there are 42% of households saving money in cash and 18% saving in golds and other saving as in table 6.3.

Table 6.3: Summary of statistical variables; AMK data from household's survey in 2007-2014

Nº	Variable	Obs	Mean	Std. Dev.	Min	Max
1	Genders(Male=1)	1,601	76.58	76.58	0	1
2	Age	1,579	44.075	12.2301	20	84
3	Marital Status	1,601	0.8301062	0.3756568	0	1
4	Households Size	1,601	4.978763	1.909397	1	13
5	Female (=1)	1,601	0.2342286	0.423648	0	1
6	Literacy	1,601	0.7089319	0.4543968	0	1
7	Secondary School	1,601	0.2129919	0.4095499	0	1
8	Primary School	1,601	0.4797002	0.4997438	0	1
9	High School	1,601	0.036852	0.1884571	0	1
10	Technical School	1,601	0.003123	0.0558143	0	1
11	University	1,601	0.0012492	0.0353332	0	1
12	House Area	1,601	42.28683	30.57566	6	440
13	Land Size	1,601	1.580988	2.666779	0	40
14	Livestock	1,601	0.2754528	0.4468818	0	1
15	Motorcycles	1,601	0.5365397	0.4988189	0	1
16	Oxcarts	1,601	0.1673954	0.3734451	0	1
17	Car Pick up trucks	1,601	0.0212367	0.1442176	0	1
18	Televisions	1,601	0.587133	0.4925031	0	1
19	Bike	1,601	0.6883198	0.4633247	0	1
20	Telephones	1,601	0.6089944	0.4881281	0	1
21	Type of Toilets	1,599	1.589118	0.8784197	1	4
22	Casual Labors	1,601	0.5209244	0.4997181	0	1
23	Factory Workers	1,601	0.2860712	0.4520643	0	1
24	Temporary Migrant	1,601	0.119925	0.3249754	0	1
25	Government Servants	1,601	0.1124297	0.3159931	0	1
26	Service Transport	1,601	0.0980637	0.2974937	0	1
27	Small Business Petty	1,601	0.1861337	0.3893361	0	1
28	Manufactory Thatch	1,601	0.1730169	0.37838	0	1
29	Textile	1,601	0.0237352	0.1522704	0	1
30	Distance (Minutes)	1,601	41.07995	38.09872	0	180
31	Child Schooling	1,601	0.0018738	0.0432607	0	1
32	Male Primary Income	1,601	0.4603373	0.4985801	0	1

33	Female Primary Income	1,601	0.2298563	0.4208718	0	1
34	Both Primary Income	1,601	0.3098064	0.4625581	0	1
35	Cloth Expenditure	1,577	140653.6	253654.4	0	8,000,000
36	School Expenditure	1,577	0.6539663	0.4758527	0	1
37	Health Expenditure	1,577	0.9544035	0.2086736	0	1
38	Agriculture Expenditure	1,601	0.7688944	0.4216715	0	1
39	Animal Rising input Expenditure	1,601	0.5858838	0.4927226	0	1
40	Reinvest Nonfarm Expenditure	1,601	0.6527171	0.4762554	0	1
41	Paying Loan Expenditure	1,601	0.8313554	0.3745547	0	1
42	Household Material Expenditure	1,601	0.4434728	0.4969496	0	1
43	Other Expenditures	1,601	0.1174266	0.3220285	0	1
44	Food Expenditure	1,601	0.9987508	0.0353332	0	1
45	Buying Gold Expenditure	1,601	0.1961274	0.3971901	0	1
46	Social Activities Expenditure	1,601	0.9881324	0.1083239	0	1
47	Total Main Expenditures	1,601	5250815	2862465	462,000	43,100,000
48	Saving Money in Cash	1,601	0.4209869	0.4938717	0	1
49	Saving in Golds	1,601	0.1836352	0.3873074	0	1
50	Saving in MFIs or Banks	1,601	0.0087445	0.0931315	0	1
51	Saving in Other Ways	1,601	0.0524672	0.2230369	0	1
52	Income Shocks	1,601	0.0562149	0.2304081	0	1
53	Weather Shocks	1,601	0.142411	0.3495804	0	1
54	Total Loans from all sources	1,601	1348764	3175982	0	56,000,000
55	Total AMK loans	1,601	341144.9	457788.5	0	8,000,000

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

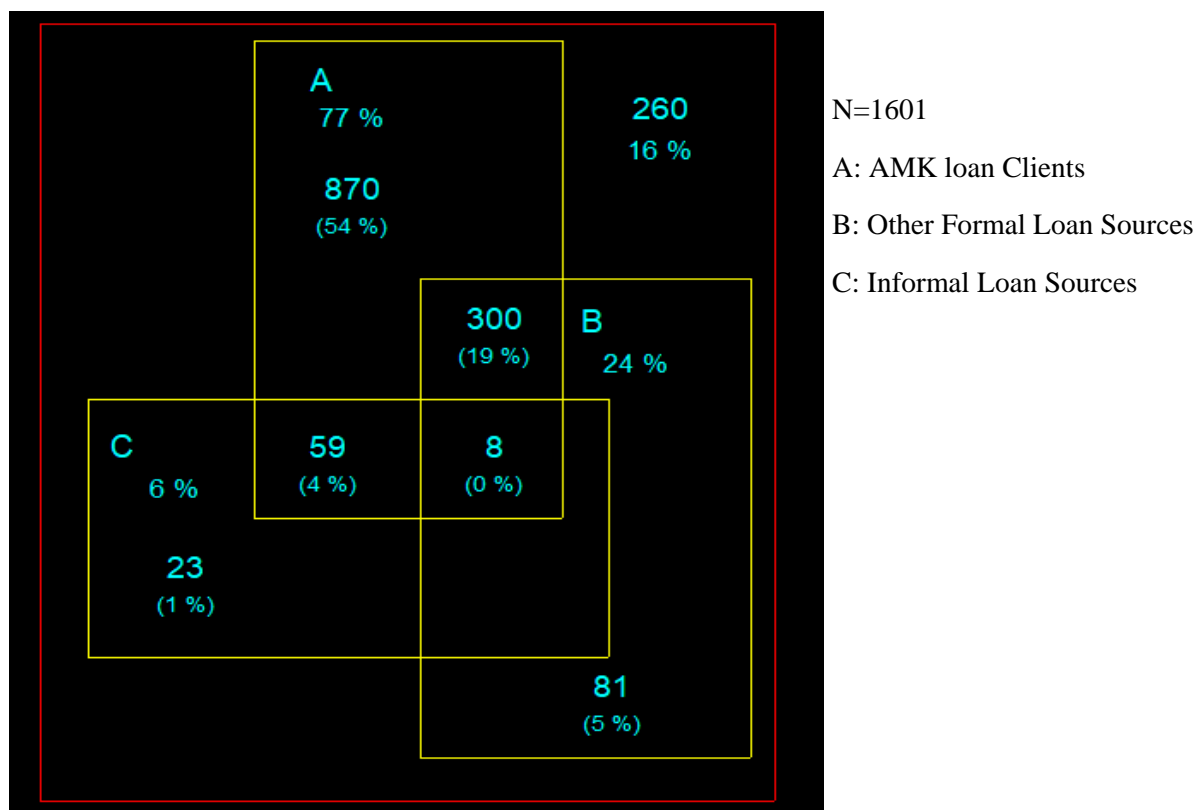
**Source:** Author's Calculation based on the AMK data

### 6.1.1 Loan Sources and Accessibility to Difference Loan Sources

In this section might be broadened well the AMK clients and its loan sources from formal and informal loan sources. Loan access is still very important for all households around the world. Furthermore, multiple loan accesses can force the households to over-indebtedness in their family.

Hence, Figure 6.1 shows well about the loan access of AMK clients to loan sources. It shows details about the AMK loan source, informal loan source and formal loan sources too. Most clients of AMK used the unique loan from AMK about 1,170 households (77%) while 300 households (19%) borrowed other formal loan source such as from banks, microfinance, rural credit operators and other association and 59 households (4%) borrowed from informal loan sources such relatives, landlords, traders, employers, friends and others. Interestingly, only 8 households (0.01%) borrowed from all sources. Among 1,601 sampling, only 24% used the loan from other formal loan sources whereas, 6% borrowed from informal loan sources.

**Figure 6.2:** Access to Credit of AMK clients



**Source:** Author's calculation based on AMK data

Due to above illustrations indicates that less households have used multiple loan sources too with three sources. This multiple loan sources can varnish the clients' difficult reimbursement to over-indebtedness (Bylander, 2019). In this context, educational levels are very important for making decision and force clients not to use multiple loan sources in order to avoid the over-indebtedness

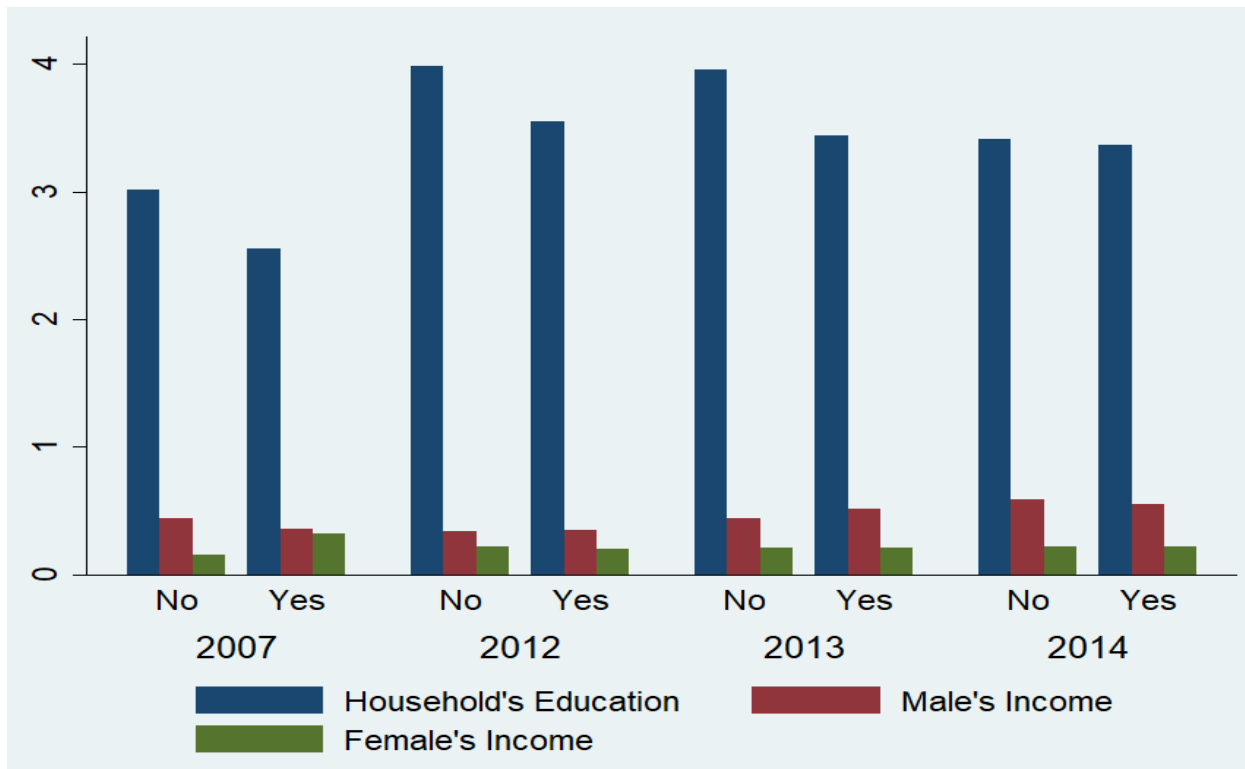
**Table 6.4:** AMK clients and Educational Levels

AMK Clients	Illiteracy Level	Primary School	Secondary School	High School	University	Technical Level
Yes	21.40%	51.92%	18.95%	5.76%	0.54%	0
No	24.92%	46.81%	21.98%	3.07%	0.24%	0.12%
Total	24.10%	47.97%	21.29%	3.68%	0.31%	0.12%

**Source:** Author's calculation based on the AMK data

Table 6.4 presents the educational levels of clients and non-clients in the sampling data. This shows that most AMK clients have educated at primary school level around 51.9% and illiteracy about 21.4% while secondary school level at 18.95%. Interestingly, only 0.54% graduated from university and no clients graduated from technical levels.

**Figure 6.3:** AMK clients with educational levels and incomes



**Note:** AMK client: Yes and No

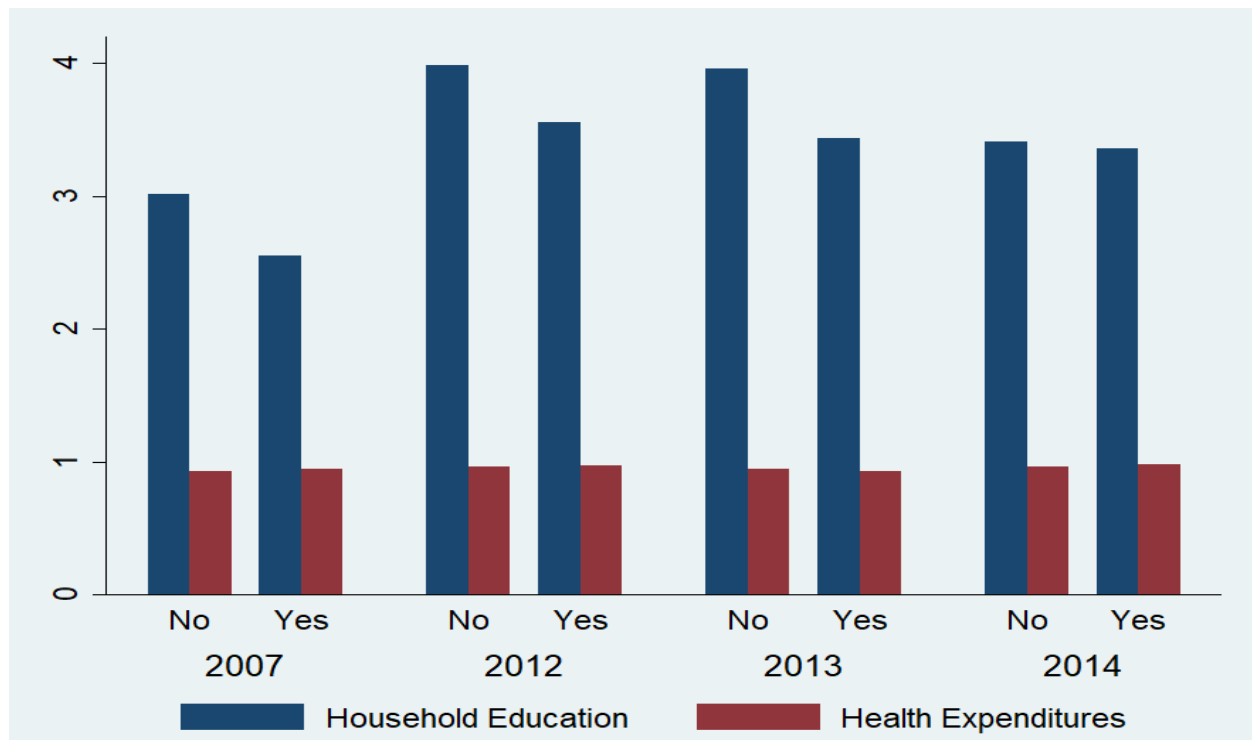
**Source:** Author's calculation based on AMK data

Figure 6.2 illustrates well about the client's educations, incomes of households by each year. In 2007, clients have lower education than non-clients as well as their incomes too. These findings seem the same as other years too. Furthermore, based on income seems sequentially to increase by



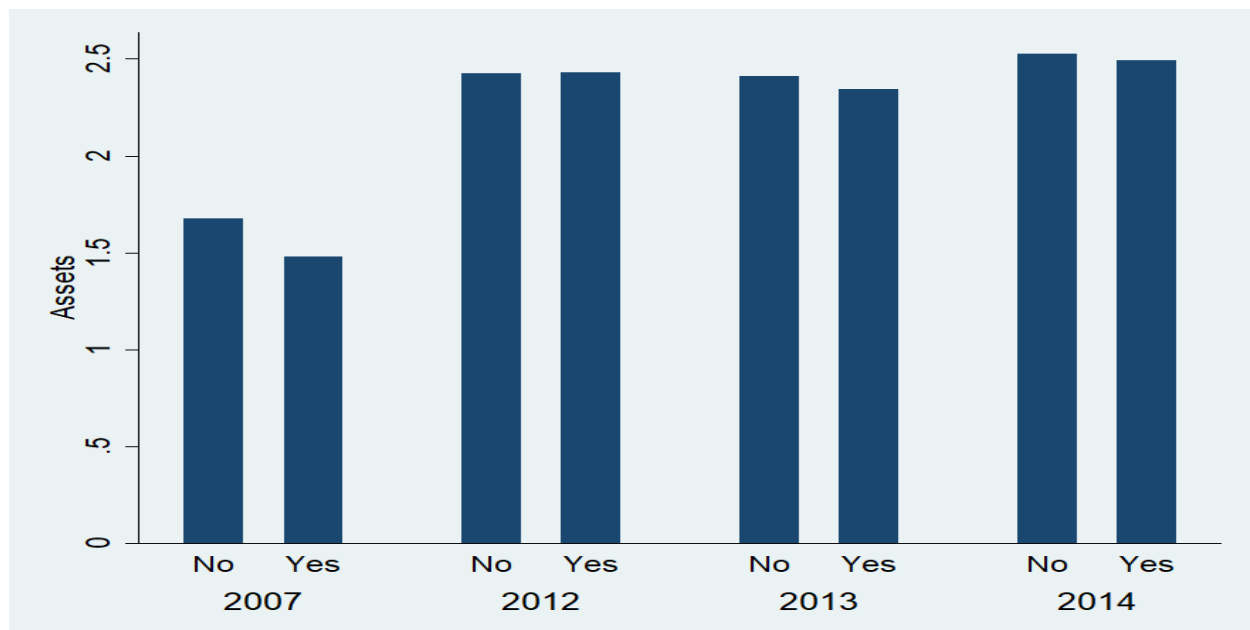
years with AMK clients. Educational level and health expenditures with clients and non-clients illustrate well as educational levels and health expenditure compared with both sides. It seems that most clients have lesser educational levels than non-clients while health expenditures are still the same due to figure 6.3's illustration. Moreover, based on all years indicate that AMK clients have less education than non-clients while health expenditures seem the same levels each year.

**Figure 6.4:** AMK clients related to education levels and Health Expenditures



**Source:** Author's calculation based on AMK data

**Figure 6.5:** AMK clients and their Assets



**Source:** Author's calculation based on AMK data

Figure 6.5 presents more details about the assets of clients and non-clients in 2007 to 2014. This shows well that most clients have less assets if compare to non-clients each years. This can be applied the AMK 's policy to support with poor. Hence, we can say that most clients are seriously selected to use their financial services such as loan. In order to know more details about these findings, the regressions might show more accurately with some models such OLS, Fixed Effect and Random Effect model as shown following.

## 6.2 Regression Results and Discussions

In section, the regression results for impacts of loan on education levels of households which is used the Fixed Effect Model. Table 6.5 presents the estimates of AMK's loan for each educational levels. First column corresponding the clients graduated the primary school level and borrowed the money from AMK microfinance institution. This column shows that AMK loan has negatively correlated with primary school level(Coef=-0.06) but it is not statistically significant at any levels. These above findings seem the same signs to illiteracy, technical school and university levels. These can be said that most of AMK clients have less educations before joining the AMK. If we take a look more details, graduated the secondary level seem positively and statistically significant at 5% significant levels. This can be interpreted that loan of AMK has impacted positively to increase the educational levels for clients at secondary levels around 12.3%. On the hand, other loans cannot

assist more the clients at all. Interestingly, most of saving money cannot help more to education level to clients too.

This might be cause of the saving less money while their incomes have limited too. Other interesting point is weather shock. It has negatively and statistically correlated with the 5% significant level at high school level(Coef=-0.01801). This means that weather shock forces to decline the education of households in term of going to school. This might be from the declined incomes and the difficult transportation to school due to this Fixed Effect model. Furthermore, Random Effect model interprets more details in order to compare both Fixed Effect(FE) model and Random Effect (RE) model as following.

Table 6.5: Fixed Effect Model; AMK loan impact on the education of households

Variables	Primary School	Secondary School	Illiteracy	High School	Technical School	University
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
AMK Loan	-0.06137	0.12297*	-0.02618	0.00974	-0.00033	-0.00199
	(0.1072)	(0.0676)	(0.0219)	(0.0089)	(0.0027)	(0.0021)
HHHGender	-0.575***	0.27195	0.09858*	-0.0310*	-0.00626	0.00433
	(0.1200)	(0.2948)	(0.0357)	(0.0126)	(0.0042)	(0.0044)
HHHMarital Status	-0.02513	0.05855	0.01192	0.00147	0.00238	-0.00136
	(0.0488)	(0.1413)	(0.0132)	(0.0049)	(0.003)	(0.0014)
HHHAge	-0.0183***	-0.00202	0.0034***	-0.00073	0.00012	-0.00007
	(0.0042)	(0.0045)	(0.0007)	(0.0005)	(0.0002)	(0.0001)
Other Loans	0.08492	-0.0892	-0.01639	-0.01227	-0.00202	0.00437
	(0.0898)	(0.0856)	(0.0243)	(0.0108)	(0.0026)	(0.0045)
Total Main Expenditures	0.25701	-0.19293	-0.0994***	0.01227	0.00533	-0.0033
	(0.1886)	(0.1656)	(0.0173)	(0.009)	(0.0034)	(0.0035)
Household Size	-0.08902*	0.08128	0.01191	-0.00023	-0.00046	0.00099
	(0.0403)	(0.0419)	(0.0057)	(0.0028)	(0.0006)	(0.0010)
Casual Labor	-0.14347	-0.02243	-0.01292	-0.01962	-0.00094	-0.00095
	(0.1873)	(0.2976)	(0.0485)	(0.0241)	(0.0011)	(0.0010)
Saving Money In Gold	0.13489	0.32188	-0.02632	0.00591	0.00891	-0.00278
	(0.11430)	(0.16560)	(0.03650)	(0.01560)	(0.00630)	(0.00280)
Saving Money In Cash	-0.00564	-0.05125	-0.00435	0.00498	-0.00246	0.00026
	(0.12310)	(0.11450)	(0.02040)	(0.00860)	(0.00360)	(0.00040)
Saving Money In Land	-0.29642	-0.00803	-0.06664*	0.04096	0.00623	-0.00098
	(0.2260)	(0.2062)	(0.0281)	(0.0247)	(0.0079)	(0.0011)
Saving Money In MFIs Or Banks	0.1789	0.81849	-0.04589	0.15295	-0.00644*	-0.00593
	(0.4121)	(0.4107)	(0.0855)	(0.1119)	(0.0030)	(0.0051)
Saving Money In Other Assets	-0.25367*	-0.07708	-0.03632	0.002	0.00502	0.0007

	(0.0978)	(0.0980)	(0.0243)	(0.0084)	(0.0030)	(0.0007)
Non-Farm Labor Cash	0.053	-0.15501	0.05927	-0.02378	-0.00482*	-0.00239
	(0.1650)	(0.2964)	(0.0611)	(0.0203)	(0.0021)	(0.0024)
Individual Shock	-0.02887	-0.08791	-0.01042	0.00402	-0.00022	-0.00238
	(0.1089)	(0.1382)	(0.0221)	(0.0100)	(0.0028)	(0.0024)
Income shock	0.27715	0.17672	0.02289	0.01339	-0.00091	-0.00135
	(0.1711)	(0.1830)	(0.0331)	(0.0265)	(0.0013)	(0.0015)
Weather Shock	-0.01683	0.16601	0.04858	-0.01801*	0.00206	-0.00062
	0.1565	(0.1771)	(0.0260)	(0.0081)	(0.0050)	(0.0007)
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Constants	1.75106 (2.6012)	10.3632*** (2.4393)	1.48577*** (0.2531)	-0.10736 (0.128)	-0.08347 (0.0514)	0.05208 (0.0537)

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

Note: HHH refers to household's head in sampling data. Standard Error is in parenthesis

\* P<0.05; \*\* p<0.01; \*\*\* p<0.001

**Source:** Author's calculation based on the AMK data

Table 6.6 broadens the Random Effect model in order to observe the impacts of AMK loan on the educational levels of households. Due to this result mentions that there are no significant variables correlated to educational levels. We can say that AMK loan has small impacts on the education and it is not based on the education to offer the loan to clients.

Table 6.6: Random Effect Model: Impact of AMK loan on the education of households

Variables	Illiteracy	Primary School	Secondary School	High School	Technical School	University
	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>
AMK Loan	-0.0128	-0.0730	-0.0211	0.0090	0.0001	-0.0020
	(0.0240)	(0.1090)	(0.0230)	(0.0090)	(0.0030)	(0.0020)
HHHGender	0.0974**	-0.5580	-0.1669	-0.0348	-0.0066	0.0035
	(0.035)	(0.115)	(0.027)	(0.012)	(0.004)	(0.004)
HHHMarital Status	0.0079	-0.0147	0.00334	0.0030	0.0024	-0.0010
	(0.013)	(0.049)	(0.007)	(0.004)	(0.003)	(0.001)
HHHAge	0.0029***	-0.017	-0.0014	-0.0006	0.0001	-0.0001
	(0.001)	(0.004)	(0.001)	(0.00001)	(0.00001)	(0.0002)
OtherLoans	-0.0209	0.064	-0.04402	-0.01443	-0.0021	0.0037
	(0.024)	(0.09)	(0.022)	(0.011)	(0.002)	(0.004)
Total Main Expenditures	-0.084***	0.2119	0.0245	0.0182	0.0058	-0.0019
	(0.018)	(0.2)	(0.017)	(0.01)	(0.003)	(0.002)
Household Size	0.0095	-0.0809	-0.00521	-0.0005	-0.0006	0.0007
	(0.005)	(0.041)	(0.005)	(0.003)	(0.001)	(0.001)

Casual Labor	-0.0030	-0.1185	-0.0509	-0.0204	-0.0006	-0.0010
	(0.051)	(0.163)	(0.035)	(0.025)	(0.001)	(0.001)
Saving Money In Gold	-0.0372	0.1816	0.0337	0.0101	0.008	-0.002
	(0.035)	(0.109)	(0.02)	(0.017)	(0.006)	(0.002)
Saving Money In Cash	-0.0075	0.0373	0.0306	0.0038	-0.0027	-0.00007
	(0.020)	(0.127)	(0.025)	(0.008)	(0.003)	0
Saving Money In Land	-0.0605**	-0.250	0.0165	0.036	0.00611596	-0.002
	(0.028)	(0.235)	(0.039)	(0.025)	(0.008)	(0.002)
Saving Money In MFIs Or Banks	-0.0464	0.1968	0.0512	0.1612	-0.005	-0.001
	(0.086)	(0.342)	(0.144)	0.119	0.003	0.001
Saving Money In Other Assets	-0.0398	-0.2414	0.0360	-0.0013	0.00432	0.00001
	(0.023)	(0.111)	(0.023)	(0.008)	(0.003)	0
Non-Farm Labor Cash	0.0624	0.02817	-0.0306	-0.024	-0.0047	-0.0026
	(0.064)	(0.149)	(0.037)	(0.021)	(0.002)	(0.003)
Individual Shock	-0.0095	-0.0381	-0.0324	0.0020	-0.0004	-0.0026
	(0.022)	(0.108)	(0.019)	(0.011)	(0.003)	(0.003)
Income shock	0.0154	0.26155	-0.0010	0.0149	-0.0006	-0.0009
	(0.0330)	(0.1780)	(0.0380)	(0.0260)	(0.0010)	(0.0010)
Weather Shock	0.0430	-0.0304	-0.0500	-0.0175	0.0010	-0.0020
	(0.026)	(0.149)	(0.034)	(0.010)	(0.005)	(0.002)
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
<i>Constants</i>	1.3430***	2.2278	-0.0363	-0.208	-0.0879	0.0311
	(0.260)	(2.755)	(0.242)	(0.137)	(0.052)	(0.034)

Note: HHH refers to household's head in sampling data. Standard Error is in parenthesis

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

\*  $P < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

**Source:** Author's calculation based on the AMK data

Health Expenditure is very crucial for households in order to earn more incomes and good health. Based on table 6.7, it derives the comparisons of Fixed Effect model and Random Effect model for health expenditures. This illustrates well that AMK loan has positively correlated with health expenditure at the 10% significant level with Fixed Effect model(Coef=0.0103) while there is no significant level at Random Effect model to health expenditures. This finding can say that one percent increases in total loans from AMK, thus, health expenditures can be increased around 1.03 percent. This means that AMK loan has more supports to health expenditure of households while this loan seems the small loan then other sources. Whereas, other loans are positively correlated to health expenditures too (Coef=0.023). Saving money in other MFIs or Banks, Random Effect model

seems positively correlated to health expenditures at 5% significant level (Coef=0.035). Hence, saving in MFIs or banks are very important for households to spend their health expenditures occasionally while other savings are not significantly correlated well. Surprisingly, individual shock is still concerned from households and it shows positive correlations to health expenditure and significant at 10% levels.

Table 6.7: Models Comparison: Impact of AMK loan on the Health Expenditures

Variables	Health Expenditures	
	<i>Fixed Effect</i>	<i>Random Effect</i>
AMK Loan	0.0103**	0.0097
	[0.00930]	[0.00848]
HHHGender	0.0237	0.0209
	[0.0114]	[0.0110]
HHHMarital Status	-0.0004	0.0002
	[0.00573]	[0.00556]
HHHAge	0.00022	0.00015
	[0.000580]	[0.000623]
Other Loans	0.0230**	0.0222**
	[0.00750]	[0.00835]
Total Main Expenditures	0.010	0.013
	[0.0151]	[0.0139]
Household Size	0.0044	0.0036
	[0.00360]	[0.00360]
Casual Labor	0.009	0.008
	[0.0283]	[0.0275]
Saving Money In Gold	0.001	-0.002
	[0.0113]	[0.0114]
Saving Money In Cash	0.014	0.013
	[0.0131]	[0.0129]
Saving Money In Land	-0.012	-0.015
	[0.0234]	[0.0258]
Saving Money In MFIs Or Banks	0.026	0.0351*
	[0.0170]	[0.0169]
Saving Money In Other Assets	0.011	0.013
	[0.00787]	[0.00762]
Non-Farm Labor Cash	-0.0042	-0.0028
	[0.0302]	[0.0287]
Individual Shock	0.0570**	0.0571***
	[0.0144]	[0.0154]
Income shock	-0.04	-0.0394*
	[0.0191]	[0.0191]

Weather Shock	0.013 [0.0107]	0.015 [0.00989]
Year-Fixed Effect	Yes	Yes
Number Observations	1578	1578
<i>Constants</i>	0.732** [0.212]	0.697*** [0.195]

Note: HHH refers to household's head in sampling data. Standard Error is in parenthesis

Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

\*  $P < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

**Source:** Author's calculation based on the AMK data

To provide further insights into the impact of AMK loan on clients, income of clients is very significant to observe. Table 6.8 indicates that AMK loan impacts on the incomes of clients with random effect and fixed effect model. This finding illustrates that AMK loan has positively and significantly correlated at 5% significant levels. This means that whenever, households used the loan from AMK forced to increase their income by 3.7% for Fixed Effect Model and 4% for Random Effect model. This can be said that AMK clients might use this loan in the right way or earning more income from this loan. Adversely, other loan source has negatively impacted on the incomes of the households with both models(Coef=-0.04). This finding evidences the same result of Zeller (1995). He stated that the microfinance encourages the rural income generation, agricultural loan, maintaining the wealth and balance of consumption. And same finding of Kashf (1996) about microfinances. Kashf mentioned that microfinance supports credit for agricultural production, smoothing of rural community's consumption and their income diversification. Casual labor is the main revenue of income in the households. Unexpectedly, weather shock is statistically significant and negatively increases at 1% significant level(Coef=-0.31). This can collaborate that the weather changed 1 unit can decline the income of households around 31% in Cambodia. This finding is the same sign of Nicolas et al., (2019) in Vietnam about the impact of weather change on income and inequality in Vietnam.

Table 6.8: Impact of AMK loan on the income from all sources of households

Variables	Income from All sources	
	Fixed Effect	Random Effect
AMK Loan	0.0373*	0.0402*
	[0.0210]	[0.0192]
HHHGender	-0.0616	-0.0593
	[0.0368]	[0.0360]
HHHMarital Status	-0.0229	-0.0240*
	[0.0131]	[0.0111]
HHHAge	0.000378	0.000544
	[0.000857]	[0.000870]
Other Loans	-0.0436*	-0.0437*
	[0.0186]	[0.0197]
Total Main Expenditures	0.0117	0.0106*
	[0.00574]	[0.00535]
Household Size	-0.0142	-0.0122
	[0.0525]	[0.0514]
Casual Labor	0.0720*	0.0821*
	[0.0338]	[0.0356]
Saving Money In Gold	-0.0322	-0.0319
	[0.0282]	[0.0268]
Saving Money In Cash	0.0848	0.0917
	[0.0434]	[0.0513]
Saving Money In Land	0.133	0.138
	[0.135]	[0.131]
Saving Money In MFIs Or Banks	0.0394	0.0395
	[0.0254]	[0.0262]
Saving Money In Other Assets	-0.0108	-0.00799
	[0.0522]	[0.0503]
Non-Farm Labor Cash	-0.0175	-0.0173
	[0.0296]	[0.0299]
Individual Shock	0.136	0.114
	[0.0656]	[0.0677]
Income shock	0.0642	0.0594
	[0.0411]	-[0.0456]
Weather Shock	-0.318***	0.305***
	[0.0707]	[0.0649]
Year-Fixed Effect	Yes	Yes
Number Observations	1578	1578
Constants	0.318***	0.305***
	[0.0707]	[0.0649]

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

**Source:** Author's calculation on AMK data

In order to know more details about the impacts of AMK loan to households such as household members and their children too, table 6.9 indicates the impacts of loan on children education in



Cambodia. Due to Fixed Effect and Random Effect model are revealed that there negatively correlated on children education and it is insignificant at any levels with both models. It seems and interprets that AMK loan has less impacts on the education of household's children expenditures. In addition, other loans have signed negatively correlation on education expenditure too. Hence, loan might not help to foster the education of family members due to this finding result. This applied the reality of Cambodian households when they have any loans, they might try to save the money more than usual expenditures. Suggesting that loan from any sources such as AMK and others might decline the expenditures in family in order to reimburse the loan back to financial institutions. Sometimes, we might say that loans might force to reduce the households' expenditures such as food expenditures, education expenditures and others in order to pay the loan back. This might be their incomes which have limited to expend and saving. Based on the descriptive statistics, children education also has small observations too in sampling survey.

Table 6.9: Impact of small loans on the children education expenditures in Cambodia.

Variables	Children Education	
	Fixed Effect	Random Effect
AMK Loan	-0.00240	-0.00241
	[0.00239]	[0.00242]
HHHGender	-0.00457	-0.00535
	[0.00474]	[0.00547]
HHHMarital Status	0.00249	0.00278
	[0.00256]	[0.00283]
HHHAge	-0.00000498	0.00000727
	[0.00000778]	[0.00000801]
Other Loans	-0.00082	-0.00134
	[0.000951]	[0.00141]
Total Main Expenditures	-0.0013	-0.000213
	[0.00127]	[0.000306]
Household Size	0.00026	0.0000264
	[0.000255]	[0.0000558]
Casual Labor	-0.000376	-0.000626
	[0.000423]	[0.000647]
Saving Money In Gold	-0.00276	-0.00241
	[0.00280]	[0.00249]
Saving Money In Cash	0.0032	0.00281
	[0.00328]	[0.00290]
Saving Money In Land	-0.0000882	-0.00113
	[0.000231]	[0.00113]

Saving Money In MFIs Or Banks	-0.00493	-0.000322
	[0.00474]	[0.00143]
Saving Money In Other Assets	0.00105	0.000494
	[0.00112]	[0.000604]
Nonfarm Labor Cash	-0.00207	-0.00215
	[0.00214]	[0.00222]
Individual Shock	-0.0014	-0.00158
	[0.00139]	[0.00156]
Income shock	-0.000428	0.000153
	[0.000454]	[0.000371]
Weather Shock	-0.00133	-0.00246
	[0.00138]	[0.00242]
Year-Fixed Effect	Yes	Yes
Number Observations	1578	1578
<i>Constants</i>	0.0155	-0.000887
	[0.0138]	[0.00338]

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

**Source:** Author's calculation on AMK data

Beside of children education expenditures, observation of total assets from households is very important in the context of AMK clients and non-clients. Table 6.10 still evidences well the comparisons of client and non-clients with total land areas. Comparing from these results, AMK loan has positively correlated but there is insignificant at any levels for AMK clients. Oppositely, loan for non-clients signs to increase and significant at 5% level (Coef=0.32) at Random Effect Model. This can reveal that loan can increase the land uses of households in Cambodia. This can interpret that loan helps the households to indirectly generate incomes and buy the lands more for family. This applied the reality occurred in Cambodia, especially in rural areas. Saving money in land can increase the total lands more than others (Coef=2.06). Most Cambodian households in rural areas do not believe on the financial institutions, especially in deposits. Most of them try to save money in their hands and some keep money in their pillow.

Table 6.10: The impacts of AMK loan on the Households Assets: Total Land Areas

Variables	Total land Area			
	Fixed Effect		Random Effect	
	Clients	Non-Client	Clients	Non-Client
AMK Loan	0.249	0.229	0.319	0.327*
	[0.285]	[0.129]	[0.290]	[0.161]
HHHGender	-0.666*	-0.161	-0.652*	-0.162
	[0.274]	[0.241]	[0.295]	[0.258]
HHHMarital Status	-0.00598	0.0155	-0.0298	-0.0757
	[0.0581]	[0.0709]	[0.0548]	[0.0948]
HHHAge	0.00336	0.00979*	-0.000726	0.0111*
	[0.00937]	[0.00461]	[0.00789]	[0.00484]
Other Loans	0.0189	0.329	0.0593	0.147
	[0.162]	[0.181]	[0.188]	[0.159]
Total Main Expenditures	0.282	0.722**	0.345	0.974**
	[0.172]	[0.200]	[0.183]	[0.304]
Household Size	0.0163	0.0826	-0.0351	0.029
	[0.0506]	[0.0501]	[0.0599]	[0.0472]
Casual Labor	0.0722	0.402	0.0788	0.445
	[0.302]	[0.193]	[0.295]	[0.245]
Saving Money In Gold	-0.142	0.186	-0.377	0.088
	[0.233]	[0.280]	[0.286]	[0.317]
Saving Money In Cash	0.194	-0.201	0.242	-0.191
	[0.188]	[0.166]	[0.217]	[0.198]
Saving Money In Land	1.247	2.065**	1.498*	2.166**
	[0.600]	[0.671]	[0.600]	[0.670]
Saving Money In MFIs Or Banks	3.192	-0.481	3.533	-0.0552
	[2.445]	[0.571]	[2.702]	[0.762]
Saving Money In Other Assets	0.0337	-0.0772	0.194	-0.0986
	[0.224]	[0.143]	[0.226]	[0.218]
Nonfarm Labor Cash	-0.28	-0.533*	-0.173	-0.349
	[0.309]	[0.205]	[0.293]	[0.250]
Individual Shock	-0.205	-0.207	-0.128	-0.227
	[0.271]	[0.143]	[0.260]	[0.184]
Income shock	-0.317	-0.0118	-0.414	-0.285
	[0.321]	[0.251]	[0.332]	[0.351]
Weather Shock	0.436	0.861*	0.524	1.075**
	[0.310]	[0.395]	[0.407]	[0.417]
Year-Fixed Effect	Yes	Yes	Yes	Yes
Number Observations	-2.796	-10.05**	-3.077	-13.07**
Constants	[2.716]	[3.130]	[2.695]	[4.211]
Observations	414	1109	414	1109

Note: Land in m<sup>2</sup>

**Note:** Individual shock: households' members are extremely sick or died or lost members and Weather shocks: some natural disasters forced to crop damage and Income Shock: Business shut down or lost and HH members lost job.

**Source:** Author's calculation based on the AMK data

## **7. Conclusion**

This paper analyses the impacts of loan on livelihoods' households such as incomes, consumptions, education and their assets in Cambodia. conclusive section is to clarify more details about the empirical findings to meet the objectives of this study by using Ordinary Least Squares regression (OLS), Fixed Effect model(FE) and Random Effect model(RE). Firstly, based on the Huasman test states that Fixed Effect model is more appreciated to use than OLS model and Random Effect models. Fixed Effect model suggests that most households using AMK loans increased their livelihoods and incomes in family. Furthermore, indirect and direct impacts of loan, it shows that other loan get worse off in terms of education expenditures while AMK loans improve the education of the households. Furthermore, loans impact positively on the health expenditures. This increases around 1.03% of health expenditures. It can say that loan is very significant to households for consumptions smoothing. AMK loan can improve the education around 12.39% across the years. Clients of AMK can foster the households' incomes by 4% due to the regression result.

In term of assets, AMK loan improves positively to the total land areas. This means that whenever, client borrowed money from AMK, they used their money to improve their assets or lands. This result is the same results of other loans to clients and non-clients too. Due to the small sampling data, children education is revealed negatively impacted from loans. This might be households trying to save more than expenditure on children's education. This might apply the best practices in current Cambodian communities. Most of AMK clients have lesser educational levels than non-clients shown in this survey. Households like to use two loans respectively while their incomes have limited. More loans can endorse them to over-indebtedness too. To prove more details, Cambodian households usually use the loan in non-productive business such as wedding expenditures, funeral expenditures, dwelling expenditures and other make-up tools which do not earn much incomes for their livelihoods.

Based on above findings, government should set the policy supported to the poor via the financial program in order to encourage the children schooling in rural areas with affordable interest

rate. The specialized MFIs should be formed up in order to empower the developments in Cambodia. Social health care might be the best option to reduce poor 's expenditures in rural areas.

Finally, to improve this research study, updated data and modelling, is to estimate the current situations about the impacts of rural finances on households transparently. Furthermore, credit information sharing should be raised up in order to avoid the asymmetric information of microfinance institutions.

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## 9. Appendix

Table A1: Impacts of AMK loan to Total main expenditures of households

Variables	Total Main Expenditures	
	Ordinary Least Squared(OLS)	
	Clients	Non-Client
AMK Loan	-0.071	0.032
	[0.051]	[0.021]
HHHGender	-0.05	-0.068
	[0.042]	[0.047]
HHHMarital Status	-0.031*	-0.024
	[0.022]	[0.019]
HHHAge	-0.003**	0.002**
	[0.002]	[0.001]
Other Loans	-0.001	-0.027
	[0.045]	[0.022]
Household Size	0.139***	0.118***
	[0.01]	[0.006]
Casual Labor	-0.073	0.001
	[0.093]	[0.048]
Total Land Areas	0.013	0.015
	[0.01]	[0.003]
Saving Money In Gold	0.131**	0.051*
	[0.06]	[0.026]
Saving Money In Cash	0.074*	0.072***
	[0.039]	[0.021]
Saving Money In Land	0.093	0.041
	[0.076]	[0.043]
Saving Money In MFIs Or Banks	0.376**	0.298
	[0.129]	[0.205]
Saving Money In Other Assets	-0.026	0.081***
	[0.041]	[0.021]
Nonfarm Labor Cash	0.030	-0.122**
	[0.095]	[0.049]
Individual Shock	-0.073*	-0.011
	[0.042]	[0.023]
Income shock	-0.029	0.004
	[0.088]	[0.048]



Weather Shock	0.096	0.010
	[0.061]	[0.028]
Constants	14.266***	14.078***
	[0.124]	[0.069]
Year-Fixed Effect	Yes	Yes
Number Observations	414	1109

Note: Standard Error in parenthesis

**Source:** Author's calculation based on AMK data

Table A.2: Hausman Test specification: Fixed Effect and Random Effect Model

Variables	Coefficients		(b-B)	sqrt(diag(V_b-V_B))
	(b)	(B)		
	Random Effect	Fixed Effect	Difference	S.E.
AMK Loan	0.313	0.224	0.089	0.038
HHHGender	-0.318	-0.318	0.000	0.051
HHHMarital Status	-0.062	-0.015	-0.047	0.023
HHHAge	0.011	0.011	0.000	0.002
Other Loans	0.103	0.227	-0.125	0.039
Total Main Expenditures	0.725	0.558	0.167	0.039
Household Size	0.014	0.061	-0.048	0.011
Casual Labor	0.391	0.339	0.052	0.085
Saving Money In Gold	-0.037	0.120	-0.157	0.046
Saving Money In Cash	-0.057	-0.057	-0.001	0.036
Saving Money In Land	2.045	1.936	0.109	0.077
Saving Money In MFIs Or Banks	1.525	1.202	0.322	0.209
Saving Money In Other Assets	0.017	-0.017	0.034	0.037
Nonfarm Labor Cash	-0.358	-0.471	0.113	0.087
Individual Shock	-0.179	-0.186	0.007	0.041
Income shock	-0.315	-0.130	-0.185	0.074
Weather Shock	0.908	0.710	0.199	0.039

Test: Ho: difference in coefficients not systematic

$$\chi^2(20) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

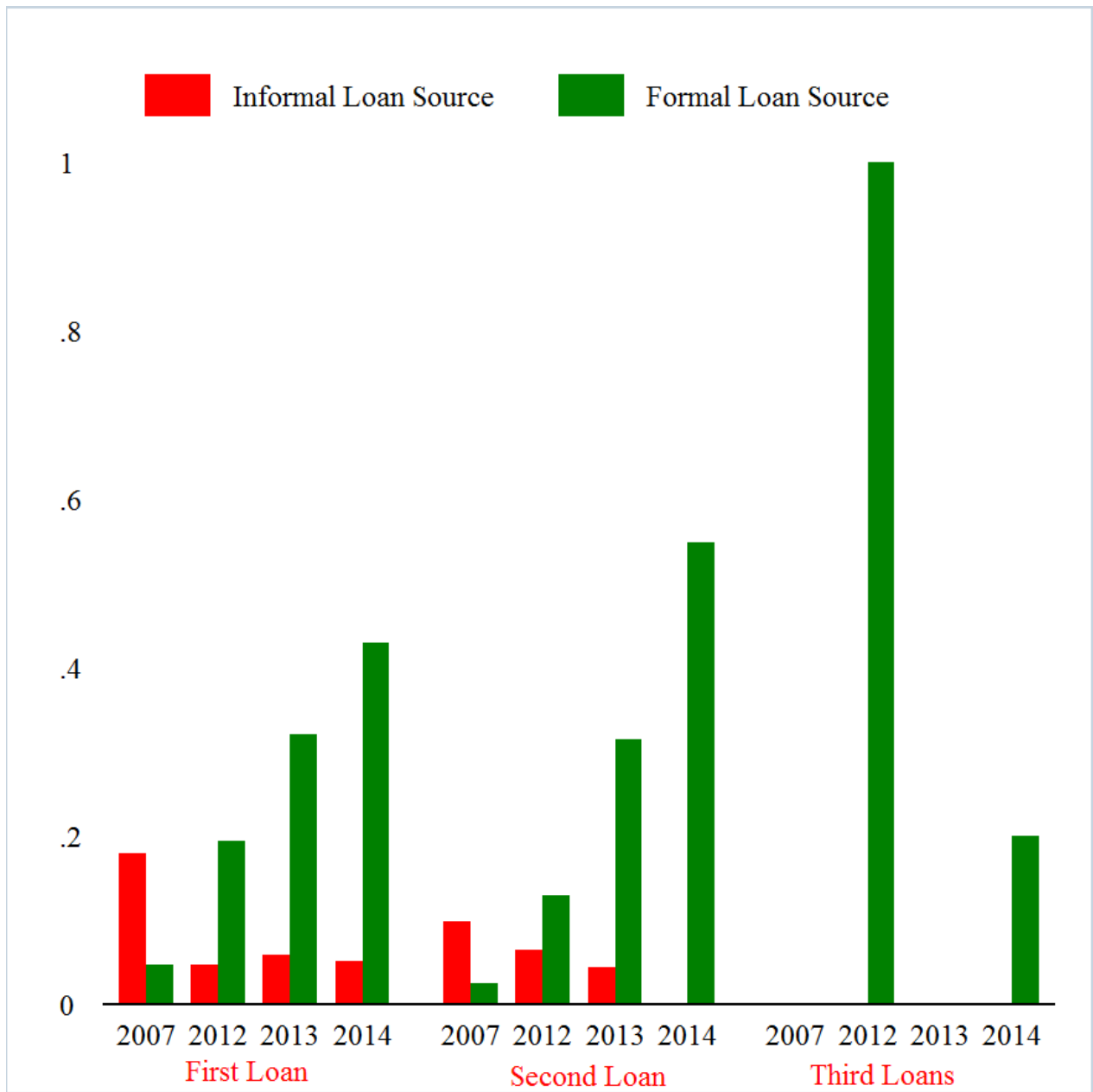
$$= 65.69$$

$$\text{Prob}>\chi^2 = \mathbf{0.0000}$$

(V\_b-V\_B is not positive definite)

**Source:** Author's calculation based on AMK data

Figure A.1: Loan Cycles and its Informal loan source and Formal loan source



**Source:** Author's illustration based on the AMK data

Table A.3: Provinces and its classification of data

Nº	Provincial Name	2007		2012		2013		2014	
		Clients	Non client	Clients	Non client	Clients	Non client	Clients	Non client
1	Bantey Meanchey	22	6	0	0	11	3	8	3
2	Battambang	35	8	0	0	16	5	14	5
3	Kompong Cham	57	13	33	9	55	18	51	16
4	Kompong Chnang	11	3	0	0	12	4	22	8
5	Kompong Speur	22	6	23	5	34	10	30	10
6	Kompong Thom	44	12	23	5	25	8	22	8
7	Kompot	0	0	11	3	23	8	18	6
8	Kandal	0	0	21	6	44	14	41	14
9	Kraties	0	0	11	3	14	4	22	7
10	Preah Vihear	0	0	0	0	7	2	12	4
11	Prey Veng	0	0	23	6	32	10	31	12
12	Pur Sat	22	6	0	0	9	3	8	3
13	Ratanak Kirri	0	0	11	2	0	0	0	0
14	Siem Reap	44	12	34	9	17	6	23	7
15	Preah Sihanouk	0	0	11	3	9	3	9	3

16	Svay Rieng	0	0	0	0	16	4	10	2
17	Takeo	0	0	34	8	29	10	25	8
18	Oddar Meanchy	24	5	0	0	8	2	14	4
Total		281	71	235	59	361	114	360	120
		352		294		475		480	

**Source:** Author's calculation based on AMK data

Table A5: Total loans and geographies of Cambodia in 2020

Province code	Province Name	# of Districts	# of Communes	# of Villages	Total Population	Adult Population ( $\geq 18$ )	Number of Borrowers	\$ Loan Balance (in million)	Share of Borrowers to Adult Population	% of Multiple Relationships	% DPD 90+
01	Banteay Meanchey	9	65	670	811,037	527,932	190,611	1,221	36%	20%	1.71%
02	Battambang	14	102	809	1,318,796	803,929	262,820	1,369	33%	25%	2.32%
03	Kampong Cham	10	109	917	1,114,482	720,182	265,764	1,215	37%	23%	1.01%
04	Kampong Chhnang	8	70	571	561,899	350,482	129,846	505	37%	20%	0.96%
05	Kampong Speu	8	87	1,377	883,975	559,104	300,368	1,468	54%	18%	0.78%
06	Kampong Thom	9	81	767	804,409	485,516	219,841	858	45%	26%	1.23%
07	Kampot	8	93	488	699,085	450,191	173,666	838	39%	20%	0.74%
08	Kandal	11	127	1,010	1,325,702	849,751	337,988	1,906	40%	21%	1.16%
09	Koh Kong	7	29	120	136,320	87,216	33,776	215	39%	20%	1.46%
10	Kracheh	6	47	258	417,231	245,761	92,980	338	38%	26%	2.91%
11	Mondul Kiri	5	21	92	90,949	50,008	22,858	122	46%	24%	2.84%
12	Phnom Penh	14	105	953	1,536,944	983,582	516,350	13,932	52%	17%	0.99%
13	Preah Vihear	8	51	232	248,250	142,868	72,172	256	51%	27%	1.03%
14	Prey Veng	13	116	1,149	1,235,321	800,559	275,880	1,061	34%	20%	0.78%
15	Pursat	7	50	511	500,699	294,792	117,047	523	40%	21%	1.17%
16	Ratanak Kiri	9	50	243	208,686	115,911	59,395	308	51%	25%	2.27%
17	Siem Reap	12	100	936	1,113,476	675,167	289,638	1,923	43%	23%	2.60%
18	Preah Sihanouk	5	29	111	223,286	144,190	63,575	633	44%	18%	1.42%
19	Stung Treng	6	35	128	158,567	91,780	31,564	147	34%	18%	1.10%
20	Svay Rieng	8	80	690	642,582	419,713	178,165	825	42%	15%	0.93%
21	Takeo	10	100	1,119	1,029,777	664,325	279,622	1,287	42%	20%	0.58%
22	Otdar Meanchey	5	24	304	255,179	155,168	77,866	284	50%	28%	1.48%
23	Kep	2	5	18	42,231	26,337	11,202	57	43%	19%	0.51%
24	Pailin	2	8	90	69,847	42,549	21,550	134	51%	28%	1.63%
25	Tboung Khmum	7	64	872	864,319	532,423	180,334	737	34%	21%	3.67%
<b>Total</b>		<b>203</b>	<b>1,648</b>	<b>14,435</b>	<b>16,293,049</b>	<b>10,219,436</b>	<b>4,204,878</b>	<b>32,158</b>	<b>41%</b>	<b>22%</b>	<b>1.28%</b>

Source: CBC (2020)